Influence of C doping on the fracture mode and abrasive wear of Al2O3Type:

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Article

Abstract:

Previous studies have shown that the addition of SiC nanoparticles to Al2O3 changes the fracture mode from intergranular to transgranular and in doing so improves the wear resistance. The reason for this is not clear but a change to the grain boundary chemistry caused by impurities such as C added with the SiC may be involved. The aim of the current study was to investigate the influence of small amounts of C doping on the fracture mode and wear properties of Al2O3. The microstructure and properties of Al2O3 doped with 0 and 0.012 wt% C were studied. Al2O3 showed mainly intergranular fracture. The addition of 0.012 wt% C to Al2O3 changed the fracture mode to mainly transgranular. The wear resistance improved and the percentage of surface grains pulled out was lower compared to pure Al2O3.

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